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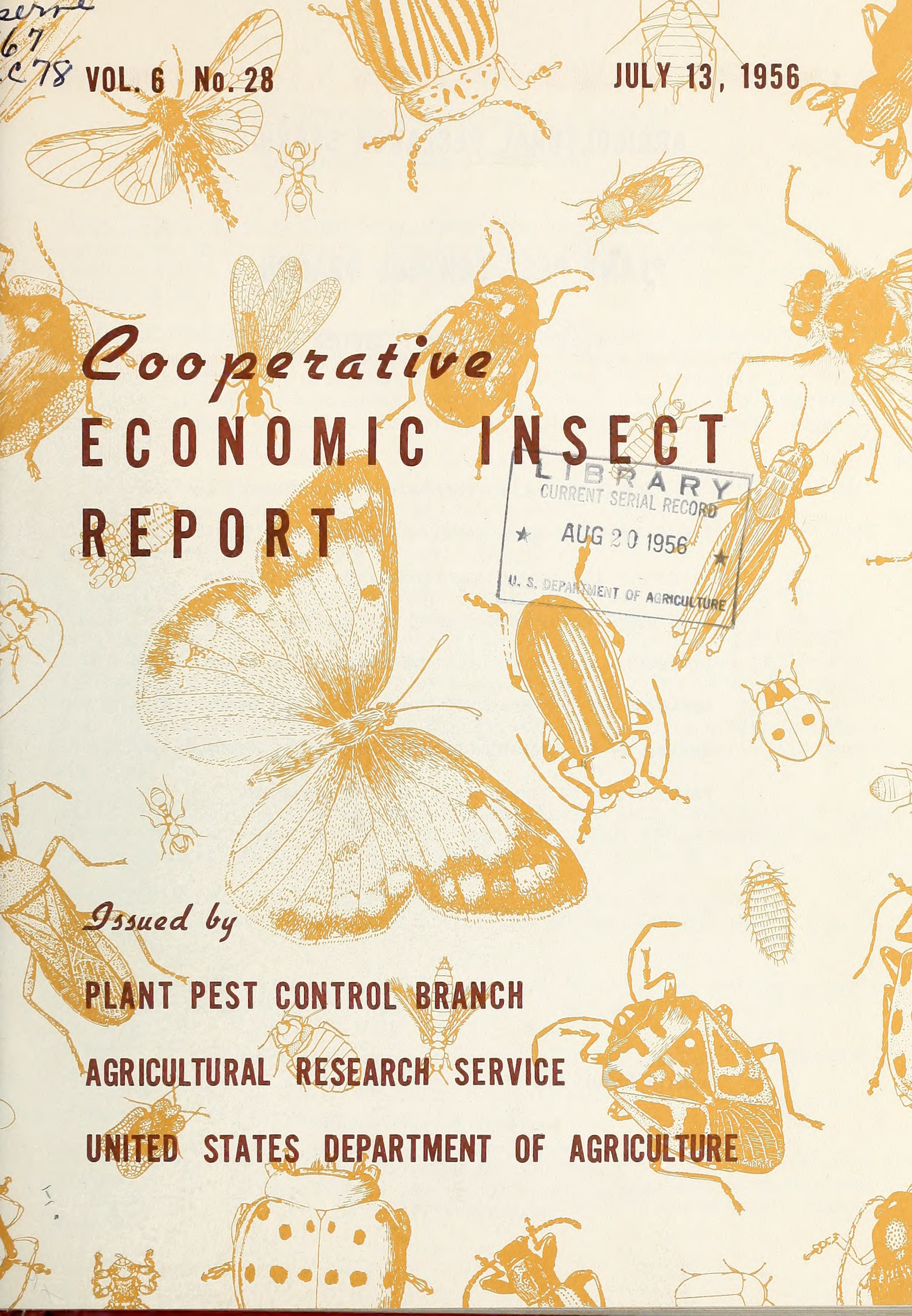

Cooperative ECONOMIC INSECT REPORT

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U. S. DEPARTMENT OF AGRICULTURE

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PLANT PEST CONTROL BRANCH
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL BRANCH

PLANT PEST SURVEY SECTION

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Branch serves as a clearing house and does not assume responsibility for accuracy of the material.

Reports and inquiries pertaining to this release should be mailed to:

Plant Pest Survey Section
Plant Pest Control Branch
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

Volume 6 July 13, 1956 Number 28

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

EUROPEAN CORN BORER infestation heavy in Massachusetts, and in some areas of Pennsylvania, Delaware, New York and Maryland. Hatch about complete in Minnesota and South Dakota. Moths for second generation emerging in Missouri. (pp. 655, 673).

GRASSHOPPERS heavy in several counties of California, damaging in some eastern Colorado counties and in Utah. These pests continue greatest insect threat in Missouri and populations are extremely high in agricultural areas of Minnesota. Damaging infestations in Oklahoma and areas of Kansas. Becoming numerous in northeast South Dakota. (pp. 655, 673).

CORN EARWORM widespread in Arkansas River Valley of Colorado, Milton-Freewater area of Oregon and eastern South Dakota. (p. 657). CHINCH BUG migration becoming general in southeastern Nebraska. Very heavy numbers continue in Missouri. (p. 657).

CORN ROOTWORM damage appearing in Illinois. (p. 658). WHEAT STEM MAGGOT injury conspicuous in southeastern North Dakota, damage reported from Caldwell, Idaho. (p. 658). LESSER CORNSTALK BORER continues to cause damage in Alabama. (p. 658). ALFALFA CATERPILLAR adults abundant in areas of Idaho and Nebraska. (p. 658). Unusually heavy build-up of PLANT BUGS on alfalfa in Sacramento Valley, California. Very high counts in Morgan County, Colorado and generally abundant in southwest Idaho. Above normal in Missouri and increasing in Wisconsin. (p. 659).

POTATO LEAFHOPPER abundant in South Dakota, Wisconsin and Delaware. Heavier than last year in Maryland. (p. 659). PEA APHID caused heavy loss in yield of alfalfa in some Colorado counties. (p. 660).

SPOTTED ALFALFA APHID reported for first time from Georgia. Build-up in southern and central Kansas and Millard County, Utah. (pp. 660, 673).

APPLE APHIDS increasing in Yakima Valley, Washington, and appearing in numbers in areas of Michigan. Generally severe in Connecticut. (p. 660, 674). ORIENTAL FRUIT MOTH heavy in twigs of peaches in areas of Michigan and New York. Unusual amount of injury in Massachusetts. (pp. 661, 673). First heavy infestation of PEAR PSYLLA in southern Idaho. (p. 661). MEDITERRANEAN FRUIT FLY reported from three additional Florida counties. (p. 663).

POTATO PSYLLID infestation general in some areas of Colorado, yellows appearing. (p. 663). STRIPED CUCUMBER BEETLE heavy on cucumbers in Wisconsin. (p. 664). ONION MAGGOT abundant in southwestern Idaho. (p. 666).

HORNWORMS generally abundant on tobacco in central Kentucky and widespread in southern Maryland. (p. 666). CABBAGE LOOPER heavy on tobacco in Tift County, Georgia; outbreak in Johnston County, North Carolina. (p. 666).

BOLL WEEVIL continues spotty in North Carolina, heaviest in south central counties; causing damage in west Tennessee and continues heavy in Louisiana. Twenty-eight percent punctured squares in 15 counties in Georgia, 31 percent in northeastern Alabama, 23 percent at Waco, Texas. (p. 667). BOLLWORM of more concern in some areas of South Carolina than boll weevil. Activity increasing in Arkansas and in south central, central and east areas of Texas. Adults increasing in Arizona. (p. 668).

JAPANESE BEETLE of concern in several Northeastern States. (pp. 657, 671).

ADDITIONAL NOTES. (p. 673).

CORRECTIONS. (p. 673).

STATES reporting - 43.

WEATHER summary. (p. 674).

SURVEY METHOD - Intensity of Sampling (Forest Insects). (p. 675).

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Reports in this issue are for the week ending July 6 unless otherwise designated.

CEREAL AND FORAGE INSECTS

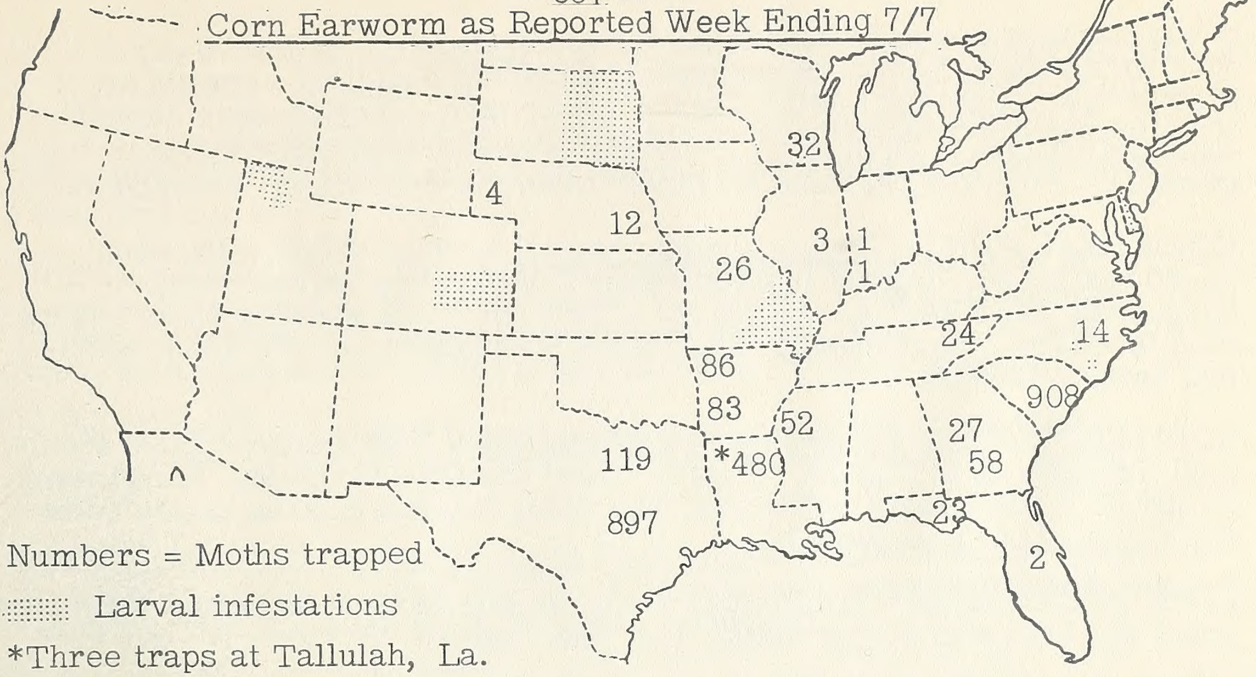
EUROPEAN CORN BORER (Pyrausta nubilalis) - MASSACHUSETTS - Infestation heavy. Judging from egg masses heaviest population of early brood in years. Moths plentiful July 3. (Bourne). PENNSYLVANIA - Heavy in some fields in southeast, especially early-planted corn. (Menusan). Some damage to corn and pods of beans in south central area but not serious. (Pepper). MARYLAND - Heavy on sweet corn in Frederick County. Average of 43 percent infestation in 13 fields. (U. Md., Ent. Dept.). DELAWARE - Abundant in corn. (Milliron). OHIO - Emergence over 80 percent in Wooster area. Forty egg masses per 100 plants and 8 percent hatched. (Guthrie, June 27). ALABAMA - Pupation of first-generation about complete and some moths emerging in northern area. (Eden). MISSISSIPPI - Several infestations found in Grenada, Leflore, Tallahatchie, Yalobusha and Panola Counties. (Ingram, Henderson). ILLINOIS - Maximum egg mass counts were 20 unhatched per 100 plants in northeastern and northern areas. Oviposition nearing completion. (Ill. Ins. Rept.). MINNESOTA - Average percentages by districts of corn plants showing leaf feeding: south central 20, southwest 26, central 12, west central 8. Hatch considered complete and borers from first to third instars. (Minn. Ins. Rept.). MISSOURI - In northwest 17 percent of plants show injury and average 30 larvae per 100 plants. First-generation pupation underway in central area with some emergence in southeast area. (Burdett). WISCONSIN - Third instars in southern area. One to 12 egg masses per 25 plants of corn 36 to 56 inches tall in 10 counties. Few egg masses June 28-29 in some northwestern counties. (Wis. Ins. Bul.). NEBRASKA - Extremely low in comparison with last year in southeast and east central areas. (Andersen). NORTH DAKOTA - Light infestation in Richland and Cass Counties, 4 egg masses per 100 plants. (N. D. Ins. Rept.). SOUTH DAKOTA - Twenty percent of plants of corn averaging 42 inches infested in northeastern counties. Hatch about complete and 40 percent of borers in second instar. (Hantsbarger).

GRASSHOPPERS - CALIFORNIA - Migration of Oedaleonotus enigma from 75,000 acres in Kern County threatened cotton and seed alfalfa; approximately 12,000 acres constituting a protective strip sprayed and migration stopped. Heavy infestations of Melanoplus devastator and some of O. enigma in Tehama County. Possibly 75,000 acres infested in Shasta County. Control underway in these counties and in areas of Nevada County. Heavy infestation appearing in coastal counties of Marin, Sonoma and Humboldt, areas not usually subject to damage. M. devastator and O. enigma infesting about 25,000 acres in Marin County, M. devastator about 50,000 acres of sheep land in Sonoma County. Large areas, many mountainous, infested in Humboldt County. (Cal. Coop. Rept., June 29). COLORADO - New damaging infestation on rangelands in Logan and Yuma Counties and on croplands in Cheyenne and Kiowa Counties. (ARS, Ext. Serv., Colo. Dept. Agr.). Total of 130,558 acres treated in Douglas and Las Animas-Baca Counties area to June 29. (GHC Proj.). NEVADA - Camnula pellucida, second instar to adults, causing severe damage to heads of crested wheatgrass in Elko County. Control underway. (Gallaway). IDAHO - Late instars, mostly M. mexicanus, spotted, seldom over 15 per square yard, in roadsides and ditchbanks in Canyon and Owyhee Counties. (Gittins). UTAH -

Serious concern on cultivated lands in Weber County. Ten to 50 per square yard on 1,800 acres rangeland in Beaver County, 50 per square yard on 1,100 acres in Sevier County. Economic injury to crops in several counties. (Chinn, Knowlton). NEW MEXICO - To June 29 - 9,970 acres treated in Cuba area and in Rosebud-Amistad area. (GHC Proj.). WYOMING - To June 29 - 73,277 acres treated in Johnson, Platte and Hot Springs Counties. (GHC Proj.). OKLAHOMA - Damaging crops, especially corn, alfalfa and sorghums, over State, more pronounced in western area. Infestations in rangeland in northern and west central counties average 4-15 per square yard, damage light. (Coppock). Total of 125,644 acres treated in Major, Ellis, Woodward and Woods Counties to June 29. (GHC Proj.). TEXAS - Medium to heavy on crops in Palo Pinto and Jack Counties. (Lindsey, Hulsey). To June 29 - 33,994 acres treated in Gray, Deaf Smith and Briscoe Counties. (GHC Proj.). SOUTH DAKOTA - Numerous in hay meadows of Black Hills area with C. pellucida averaging 60 per square yard in some localities. Eighteen M. bivittatus per square yard in some areas also. (Bell). Grasshoppers, mostly M. femur-rubrum, becoming numerous in northeast area legumes; 12 nymphs per square yard in alfalfa. Many newly-hatched nymphs. (Hantsbarger). NORTH DAKOTA - Local scattered infestation. Some leaf stripping in margins of small grain. (N. D. Ins. Rept.). NEBRASKA - Severe in many eastern counties and sections of southwestern area. Movement into alfalfa and corn underway. From 9-36 per square yard in alfalfa and 12-81 in margins of legume and row crops. M. mexicanus mainly adults in southern two-thirds of State. M. bivittatus mainly fifth instar but some adult. M. femur-rubrum and M. differentialis from second to fourth instars. (Andersen). MINNESOTA - Extremely high levels throughout most agricultural areas. Grasshoppers only one-third to two-thirds grown and still around hatching beds. (Minn. Ins. Rept.). WISCONSIN - M. femur-rubrum still hatching. Heavy in some fields in most counties. Grasshoppers damaging several soybean fields in Dunn and Pepin Counties. (Wis. Ins. Bul.). MISSOURI - Continue greatest insect threat over most of State. Twelve to 65 per square yard causing heavy damage to pastures, red clover and alfalfa in southwest and over northern two-thirds of State. Fifteen to over 150 per square yard in margins causing considerable marginal damage to row crops. M. bivittatus and M. mexicanus adult and egg-laying underway. M. differentialis from second to last instar. (Kyd, Thomas). KANSAS - Total of 85,270 acres treated in Comanche County to June 29. (GHC Proj.). ILLINOIS - Hatch practically complete in northwestern area. Some fields of alfalfa have overall count of 4 nymphs per square yard. (Ill. Ins. Rept.). SOUTH CAROLINA - Warrant control in pastures in McCormick County, June 27. (Bonnette, Nettles). MARYLAND - Five small nymphs per sweep on alfalfa in Queen Annes County. (U. Md., Ent. Dept.). DELAWARE - Destructive to corn and alfalfa in many locations. (Milliron).

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - OKLAHOMA - Mostly pupal stage in western counties but a few moths have emerged. Stalk infestation 3-10 percent in Major and Dewey Counties. (Coppock).

SUGARCANE BORER (Diatraea saccharalis) - LOUISIANA - Heavy moth flights at Franklin. Application of insecticides underway in many plantations in southern area of cane belt. (Oliver).


Corn Earworm as Reported Week Ending 7/7

Numbers = Moths trapped

▨ Larval infestations

*Three traps at Tallulah, La.

CORN EARWORM (Heliothis zea) - COLORADO - Widespread infestation on corn in Prowers, Bent, Otero and Pueblo Counties, June 30. (Exp. Sta.). UTAH - Infesting five percent of early sweet corn in Davis and Box Elder Counties. (Dorst). OREGON - Infestation general in Milton-Freewater area. Eggs and larvae on approximately 1 percent of tassels June 25. (Brown). SOUTH DAKOTA - Larvae prevalent in corn in eastern areas. (Hantsbarger). MISSOURI - Very few larvae in whorls of corn and 0-2 eggs per silk on sweet corn. Moth activity increasing in southeast area. (Kyd, Thomas). WISCONSIN - One second-instar larva in corn June 29 in Rock County. (Wis. Ins. Bul.). NORTH CAROLINA - Averaged .4 eggs per silk at Clayton and .3 at Faison, unusually low for time of season. (Farrier). DELAWARE - Infesting corn in some areas. (Milliron).

CHINCH BUG (Blissus leucopterus) - OKLAHOMA - One to 5 per plant on young sorghums in Payne, Noble and surrounding counties, damage only in margins. (Coppock). NEBRASKA - Migrations into corn and sorghum becoming general in southeastern area. Counts very high, 25-350 per stalk. (Andersen). MISSOURI - Very heavy numbers continue to injure corn, sorghums and Sudangrass over much of State. Migration from small grains continued in northern third. Many fields in extreme southeast have 10-30 bugs per plant while about 40 percent of corn in north half of State has average of 10-55 bugs per plant. Many fields of corn have marginal rows destroyed. (Kyd, Thomas). GEORGIA - Moderate on corn in Forsyth County. (Rucker).

JAPANESE BEETLE (Popillia japonica) - VIRGINIA - Medium on corn in Spotsylvania County but heavier than last year. (Kash). Heavy on corn in areas of Charlotte and Amherst Counties. (Morton, Morris). DELAWARE - Unusually prevalent in alfalfa and corn in Sussex County. (Milliron).

ENGLISH GRAIN APHID (Macrosiphum granarium) - IDAHO - Very abundant in 30-acres of wheat near Caldwell. No damage. (Bechtolt). UTAH - Moderate damage to wheat in some areas. (Knowlton). WASHINGTON - Light to medium in 150 acres of barley near Rock Island. (Kamal). Five to 8 per head on winter wheat near Ephrata. (Brannon).

CORN LEAF APHID (Rhopalosiphum maidis) - OKLAHOMA - Between 25-50 per young sorghum plant in Payne County, less farther west. (Coppock). NEBRASKA - Light, 20 of 25 corn plants show colonies beginning in whorls. (Andersen). ALABAMA - Attacking corn in some northern areas. (Arant).

CORN ROOT APHID (Anuraphis maidi-radicis) - NEBRASKA - Light localized infestations in Custer, Nemaha, Cass and Otoe Counties. (Andersen). ILLINOIS - Much more noticeable than usual in western area as are cornfield ants. (Ill. Ins. Rept.).

CORN ROOTWORMS - ILLINOIS - Many cornfields have damage. Maximum count one field was 26 per stalk. (Ill. Ins. Rept.).

WHEAT STEM MAGGOT (Meromyza americana) - NORTH DAKOTA - Infestations conspicuous in spring wheat in southeastern area. (N. D. Ins. Rept.). IDAHO - Estimated 50 percent damage in 20-acre wheat field near Caldwell. (Scott, Gittins).

DUSKY SAP BEETLE (Carpophilus lugubris) - DELAWARE - Increasing in injured corn whorls in Kent and Sussex Counties. (Milliron).

SOD WEBWORMS - OREGON - Crambus sp. adults in grass fields in Union County in greater numbers than last year. Damage has also been greater. (Every).

MORMON CRICKET (Anabrus simplex) - NEVADA - Light infestation on six square miles White Pine County. (Gallaway, Del Curto). Total of 35,064 acres baited in Utah, 2,464 acres in Colorado, 8,624 acres in Nevada, 4,158 acres in Idaho. Grand total to June 29 was 50,310. (GHC Proj.).

ARMYWORM (Pseudaletia unipuncta) - TEXAS - Heavy on young rice in Jefferson County. (Bowling).

LESSER CORNSTALK BORER (Elasmopalpus lignosellus) - ALABAMA - Continues to cause damage in various areas. Approximately 100 acres of grain sorghum destroyed in Lowndes County. Also damaging this crop, field peas and peanuts in other sections. (Arant).

ALFALFA CATERPILLAR (Colias philodice eurytheme) - IDAHO - Adults abundant in Grandview and Bruneau areas. (Gittins). NEBRASKA - Adults very abundant in alfalfa in eastern third of State. From 2-4 larvae per sweep. (Andersen). DELAWARE - Prevalent some areas. (Milliron).

ALFALFA WEEVIL (*Hypera postica*) - IDAHO - Heavy damage at end for current season. (Gittins). OREGON - Adults and larvae collected in Wallowa County June 26. New county record. (Every). UTAH - Serious delay in second-growth alfalfa in severely infested fields. (Knowlton). DELAWARE - Very destructive on second-growth alfalfa at Middletown. (Milliron).

BLISTER BEETLES - OKLAHOMA - *Epicauta* spp. common in alfalfa, damaging blossoms in isolated fields. (Coppock). NORTH DAKOTA - Damaging soybeans in several areas. (N. D. Ins. Rept.). MISSOURI - Some injury to alfalfa, soybeans and gardens. (Kyd, Thomas).

CLOVER SEED CHALCID (*Bruchophagus gibbus*) - WEST VIRGINIA - Adults active on red clover and alfalfa over State. (Dorsey, Hansen, June 30).

CLOVER ROOT CURCULIO (*Sitona hispidula*) - IDAHO - Adults more abundant in alfalfa in Boise Valley than previously observed; 6 per sweep. Larval injury on all tap roots sampled. (Gittins).

GREEN CLOVERWORM (*Plathypena scabra*) - DELAWARE - Very abundant in alfalfa generally. (Milliron).

PLANT BUGS - CALIFORNIA - Unusually heavy build-up of lygus bugs in Sacramento Valley with greatest damage in seed crops. (Cal. Coop. Rept., June 29). COLORADO - Extremely high on alfalfa for seed in Morgan County, 700-800 per 100 sweeps. (Ext. Serv.). IDAHO - Generally abundant on alfalfa in Canyon, Owyhee and Elmore Counties, 3-4 per sweep in fields in northern Canyon County. (Scott, Gittins). NEBRASKA - *Adelphocoris rapidus* appearing in alfalfa in eastern area but counts low. (Andersen). MISSOURI - *Lygus lineolaris* above average in alfalfa. From .2 to 4.3 per sweep in southeast area. (Kyd, Thomas). WISCONSIN - *Adelphocoris* spp. and *L. lineolaris* in large and increasing populations in alfalfa. (Wis. Ins. Bul.). LOUISIANA - From 84-128 *L. lineolaris* per 100 sweeps in Rapides, Natchitoches and Bossier Parishes. (Oliver). DELAWARE - *A. lineolatus* adults numerous some areas. (Milliron).

POTATO LEAFHOPPER (*Empoasca fabae*) - SOUTH DAKOTA - Abundant in alfalfa in northeast area, up to 28 adults per 20 sweeps. (Hantsbarger). MISSOURI - From .3-5 per sweep on alfalfa in southeast areas; .5-3 per sweep over remainder of State. (Kyd, Thomas). WISCONSIN - Large and increasing populations. (Wis. Ins. Bul.). MARYLAND - From 1-15 adults and nymphs per sweep on alfalfa in Allegany, Frederick and Queen Annes Counties. Damage conspicuous in some fields. Heavier than last year at this time. (U. Md., Ent. Dept.). DELAWARE - Abundant in alfalfa generally. (Milliron).

MEADOW SPITTLEBUG (*Philaenus leucophthalmus*) - DELAWARE - Adults very abundant generally. (Milliron).

THRIPS - VIRGINIA - Problem on peanuts in Greensville County. (Rogers).

PEA APHID (Macrosiphum pisi) - COLORADO - Reduced yield 50 percent of first cutting of alfalfa in Montrose, Delta and Mesa Counties. Similar reduction in several other counties. Infestation building up on second cutting in some areas. (Exp. Sta., Ext. Serv.). IDAHO - Abundant in most alfalfa in Boise Valley area. Damage not severe. (Gittins, June 29). NEBRASKA -Continues lower than last year. (Andersen).

SPOTTED ALFALFA APHID - CALIFORNIA - Heavy in 70-acre field in Tehama County, June 22; first report of heavy infestation in Sacramento Valley in 1956. Very light in Santa Barbara County June 21. (Cal. Coop. Rept.). NEVADA - No development of infestation in White Pine County where infestation heavy in 1955. (Cook). COLORADO - Heaviest infestation in Prowers County, progressively lower through Bent, Otero to Pueblo Counties. Also collected in Delta and Montezuma Counties. (Exp. Sta.). IDAHO - Remains extremely low in Woodruff area. None found in fields checked in southwestern area. (Portman, Gittins). UTAH - Noticeable build-up in parts of Millard County. (Knowlton, Goodarzy). OKLAHOMA - Non-economic population in all areas. (Coppock). MISSOURI - Remains generally low. Can be found over southern half of State. (Kyd, Thomas). GEORGIA - Collected on alfalfa in Henry County. Determined Louise M. Russell. First record for State. (Johnson).

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) - IDAHO - Extremely abundant in 20-acre clover seed field near Parma, heavy damage to leaves. (Scott, Gittins).

FRUIT INSECTS

CODLING MOTH (Carpocapsa pomonella) - NEW JERSEY - Moth flights in southern area essentially ceased. (Ins.-Dis. News.). DELAWARE - First moth new brood emerged July 2. (Stearns). INDIANA - Hatching of second-brood larvae expected throughout July in Vincennes area. (Hamilton). ILLINOIS - Hatching of second brood underway in Carbondale area. (Chandler). OHIO - First larvae taken under bands on June 30. Rapid increase since. (Cutright). WISCONSIN - First brood passed peak in southern area. (Wis. Ins. Bul.). COLORADO - Expect second-brood larvae between July 12 and 16 in Delta, Montrose and Garfield Counties. (Exp. Sta.). WASHINGTON - First-brood larvae pupated between June 21 and 26 in Yakima Valley. (Luce-Yakima Spray Bul.).

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) - OHIO - Second-generation adults emerging. (Cutright). WISCONSIN - All stages in orchards in southern area. Possibility of late third brood which could be very important on apples at harvest. (Wis. Ins. Bul.).

A CASE-MAKING MOTH (Apterona crenulella) - UTAH - Infesting apple, peach, cherry, ornamentals and range plants in Cache County. (Knowlton, Thatcher).

APPLE APHID (Aphis pomi) - WASHINGTON - Increase on apple. (Luce, Yakima Spray Bul.). MICHIGAN - Appearing in numbers at Hart, Manistee, Scottville, Grand Rapids, Traverse City and Empire. (Hutson, June 27).

APPLE MAGGOT (Rhagoletis pomonella) - NEW JERSEY - Ovipositing in Camden County, June 26. (Ins.-Dis. News.). MICHIGAN - Found in Lawton, Paw Paw, Bangor, Grand Rapids and Newaygo. (Hutson, June 28).

PLUM CURCULIO (Conotrachelus nenuphar) - ILLINOIS - Evidence of second brood on apples and peach. (Chandler). DELAWARE - First emergence summer brood, July 2. (Stearns). GEORGIA - Second-generation eggs in peaches on June 27. (Snapp). OHIO - First-brood larvae began emerging from drop peaches June 26. (Rings).

EUROPEAN EARWIG (Forficula auricularia) - IDAHO - Nuisance in some fruit orchards in southwestern area. In one peach orchard, earwigs found inside peaches. (Gittins).

ORIENTAL FRUIT MOTH (Grapholitha molesta) - MASSACHUSETTS - More than usual amount of early twig injury. (Wheeler). WASHINGTON - Second-brood larvae on peaches near Sawyer but no attack yet. (Luce-Yakima Spray Bul.). MICHIGAN - Second-brood larvae numerous in tips of young peach trees about Lawton, Sodus, Lawrence and Allegan. (Hutson, June 25).

CAT-FACING INSECTS - OHIO - Most abundant species of cat-facing plant bugs in northern area were Neolygus caryae and N. omnivagus. Populations of N. quercalbae light. (Rings, June 29). CALIFORNIA - Damaging peaches in Placer County. (Cal. Coop. Rept.).

LESSER PEACH TREE BORER (Synanthedon pictipes) - MICHIGAN - Adults numerous from New Buffalo to Suttons Bay. (Hutson, June 28).

CORN EARWORM (Heliothis zea) - SOUTH CAROLINA - Damage to peaches, Spartanburg. (Ferree, June 29).

PEAR-SLUG (Caliroa cerasi) - IDAHO - Abundant on pear trees north of Parma where regular spray schedule omitted. Population averaged one larva per four trees. Evident on cherry trees in same area. (Gittins). OREGON - Skeletonizing foliage of unprotected cherry and plum trees in Willamette Valley. (Capizzi). PENNSYLVANIA - Some small pear trees almost defoliated in Lancaster County. (Pepper). RHODE ISLAND - Found on pear stock in a Middletown nursery. (Mathewson).

PEAR PSYLLA (Psylla pyricola) - IDAHO - Heavy infestation found for first time in southern Idaho near Weiser. Occurred in northern part of State for number of years. All stages were found in the infestation. (Manis).

PEAR LEAF BLISTER MITE (Eriophyes pyri) - IDAHO - Common throughout southwestern area. (Gittins).

A LEAF MIDGE (Dasyneura pyri) - OREGON - Preventing unrolling of new leaves in several pear orchards throughout the Willamette Valley, July 3. (Capizzi).

FALL WEBWORM (Hyphantria cunea) - LOUISIANA - Populations heavy generally over State with many pecan trees completely defoliated. (Oliver).

TORTRICIDS (Pandemis spp.) - IDAHO - Light infestation in cherries at Emmett. Some orchards showing 5 percent infestation of fruit. (Gittins).

ROSE CHAFER (Macrodactylus subspinosus) - MICHIGAN - Generally a nuisance on apples, cherries and roses in all areas south of Muskegon-Bay City line. (Hutson, June 26). PENNSYLVANIA - Fairly numerous, damage to young peaches in Warren County. Numerous on rose and grape in Crawford County. (Adams, June 25).

PERIODICAL CICADA (Magicicada septendecim) - WISCONSIN - Causing damage by laying eggs in branches. Very severe damage to young orchard trees with older trees having "flags" in Richland County. (Wis. Ins. Bul.).

ORCHARD MITES - INDIANA - Averaged 2.8 per leaf in Orleans area. (Marshall). Tetranychus spp. becoming predominant species in several orchards in Vincennes area. (Hamilton). OHIO - Populations of Metatetranychus ulmi generally increasing. (Cutright). WASHINGTON - Only species which is increasing on apples in Yakima Valley is Vasates schlechtendali. Exceptionally good control of Tetranychus spp. obtained. (Luce, Yakima Spray Bul.). MICHIGAN - M. ulmi quite noticeable on untreated apples and plums (Hutson, June 25).

APPLE LEAF SKELETONIZER (Psorosina hammondi) - ILLINOIS - In some places especially unsprayed trees, moderate to severe in Carbondale area. (Chandler).

A TWIG BORER (Oberea ruficollis) - NORTH CAROLINA - Local infestation in blueberry in Craven County. (Kolbe, Fulton).

CRANBERRY ROOTWORM (Rhabdopterus picipes) - NORTH CAROLINA - Adults damaging blueberry leaves locally in Craven County. (Kolbe, Fulton).

BLACK-HEADED FIREWORM (Rhopobota naevana) - WASHINGTON - Hatching expected during first two weeks July. Potential infestation of cranberry bogs in Pacific County appears moderate to serious. (Tidrick).

CHERRY FRUITWORM (Grapholitha packardi) - MICHIGAN - Numerous on blueberries in Lapeer area. Observed at South Haven and Breedsville. (Hutson, July 1).

MEXICAN FRUIT FLY (Anastrepha ludens) - CALIFORNIA - Adult trappedin a lush growth canyon 1/3 mile north of Mexican border and 1/2 mile east of San Ysidro gate. Area being treated. (Harper).

MEDITERRANEAN FRUIT FLY (Ceratitis capitata) - FLORIDA - Recent new infestations, reported between June 19 and July 11 include Monroe, Okeechobee and Lake Counties. This makes a total of 21 counties since the initial discovery, April 13 at Miami. (P. P. C.).

TRUCK CROP INSECTS

TOMATO FRUITWORM (Heliothis zea) - COLORADO - Some egg-laying on tomato. (Exp. Sta.). UTAH - Eggs 1 per 100 leaves in tomato fields in northern area. High count for season of year. (Dorst).

STINK BUGS - SOUTH CAROLINA - Injury to tomatoes in Beaufort County. Numerous and difficult to control. (Nettles, June 30).

STALK BORER (Papaipema nebris) - MASSACHUSETTS - Serious on peppers and tomatoes. (Bourne, June 22).

POTATO LEAFHOPPER (Empoasca fabae) - DELAWARE - Heavy on potatoes and black-eyed peas in several places and prevalent on lima beans in Sussex County. (Milliron). MARYLAND - Abundant on beans and potatoes in Allegany and Washington Counties. (U. Md., Ent. Dept.). PENNSYLVANIA - Adults and nymphs building up on potato in Lancaster County. (Pepper). VIRGINIA - Fairly numerous on snap beans in eastern area. (Brubaker, Greenwood, Hofmaster). WISCONSIN - Damaging snap and lima beans in many localities, 10-16 per plant in Columbia and Wood Counties. Damaging soybeans in Chippewa, Eau Claire and Pepin Counties. (Wis. Ins. Bul.). NORTH DAKOTA - Migrating into untreated potato fields of upper Red River Valley. Average of 17 per 25 sweeps. (N. D. Ins. Rept.).

POTATO PSYLLID (Paratrioza cockerelli) - COLORADO - Infestations on potatoes and tomatoes in Prowers, Bent, Otero and Pueblo Counties in southeastern area; general infestation Rio Grande, Saguache, Alamosa, Conejos and Costilla Counties in San Luis Valley; and Larimer, Weld, Adams, and Morgan Counties in northeastern area. Populations on matrimonyvine and bindweed high. Yellows appearing in potatoes and tomatoes. Many fields treated. (Exp. Sta.).

POTATO FLEA BEETLE (Epitrix cucumeris) - DELAWARE - Injuring untreated potatoes at several places. (Milliron). MAINE - Populations and feeding injury generally light or very light in Presque Isle. (Shands).

BLISTER BEETLES - KANSAS - Heavy on commercial tomatoes in Kiowa County. Of concern on ornamentals and home gardens in some areas. (Matthew).

HORNWORMS (Protoparce spp.) - DELAWARE - Eggs and small larvae present on tomatoes generally. (Milliron). VIRGINIA - Infestation severe on tomato plants in northern neck counties. (Farmer). UTAH - Scattered damage to tomato and potato fields. (Knowlton).

EUROPEAN CORN BORER (Pyrausta nubilalis) - DELAWARE - Severe damage to potatoes west of Middletown with unusual amount of stalk breakage generally. Pupation noted west of Middletown. (Milliron). VIRGINIA - Irish potato stalks heavily infested on Eastern Shore. (Brubaker, Greenwood, Hofmaster). MASSACHUSETTS - Potatoes and other crops have heavy infestations in some areas. (Crop Pest Cont. Mess.).

COLORADO POTATO BEETLE (Leptinotarsa decemlineata) - NORTH DAKOTA - Larvae causing some foliage injury to unsprayed fields in upper Red River Valley. (N. D. Ins. Rept.). PENNSYLVANIA - Numerous tomato plants in commercial plantings completely defoliated in southeastern area. (Menusan).

WIREWORMS - SOUTH CAROLINA - Caused serious and extensive damage to commercial potato crop in Charleston County in the spring. Conoderus falli only species found in 12 of 15 fields under close observation. An average of 43.1 percent of tubers from untreated plots showed feeding injury. Control of C. falli by chlorinated hydrocarbon insecticides lower than before obtained locally. Evidence of considerable resistance to certain insecticides. (Reid). COLORADO - First emergence of Hemicrepidius memnonius in Boulder County June 21-29. Larvae caused serious damage to potatoes and sugar beets in recent years. (Exp. Sta.).

POTATO APHIDS - MAINE - Spring migration about 2 weeks late. Majority mature by July 7. Overall aphid populations on potatoes very light, considerably lighter than usual for period. Aphis abbreviata predominates followed by Macrosiphum solanifolii and Myzus solani. A single infestation of Myzus persicae found for first time on July 6. (Shands). WASHINGTON - Occurring in most potato fields in Grant County, 2-3 aphids per leaf. About 80 percent M. persicae with remainder M. solanifolii. (Kamal, Brannon, Landis).

SPIDER MITES - VIRGINIA - Injury showing on beans in eastern area. (Brubaker, Greenwood, Hofmaster).

PALE-STRIPED FLEA BEETLE (Systena blanda) - DELAWARE - Unusually abundant on lima beans near Slaughter Beach. (Milliron).

LEAFHOPPERS - NEW JERSEY - Greater numbers on beans than in 1955. Damaging in particular to snap beans. (Ins.-Dis. News.).

GREEN CLOVERWORM (Plathypena scabra) - DELAWARE - Feeding heavily on limas at Milford. (Milliron). VIRGINIA - Considerable feeding on snap beans in eastern area. (Brubaker, Greenwood, Hofmaster).

STRIPED CUCUMBER BEETLE (Acalymma vittata) - WISCONSIN - Heavy on cucumbers in many sections. (Wis. Ins. Bul.).

MEXICAN BEAN BEETLE (Epilachna varivestis) - CALIFORNIA - After nine and one-half years of intensive effort, the beetle has been eradicated from State's only known infestation in Ventura County. (Jacobsen, Nov. 30, 1955). COLORADO - Damaging numbers in Larimer, Weld, Boulder, Montrose and Delta Counties. (Exp. Sta.). WISCONSIN - Eggs and larvae in one Dane County snap bean location. (Wis. Ins. Bul.). SOUTH CAROLINA - Damage to snap beans serious, Beaufort County. (Nettles, June 28). VIRGINIA - Severe on snap and lima beans in Hampton City area. (Adams). Numerous and defoliating untreated snap beans in eastern area. (Brubaker, Greenwood, Hofmaster).

ALFALFA WEEVIL (Hypera postica) - PENNSYLVANIA - Considerable feeding on the basal parts of pea and bean plants in Dauphin and Schuylkill Counties. (Menusan).

ALFALFA LOOPER (Autographa californica) - WASHINGTON - Two-hundred acres of peas in Coulee City area heavily infested, control effective. (Brannon).

BEET WEBWORM (Loxostege sticticalis) - COLORADO - Moderate to heavy infestations in eastern areas. (Chem. Ind., Ext. Serv., Exp. Sta.).

BEET LEAFHOPPER (Circulifer tenellus) - CALIFORNIA - Loss by curly top in tomatoes in San Diego County normal on June 20. Damage will probably not exceed 5 percent. Mapping of Russian-thistle in San Joaquin Valley showed approximately 250,000 acres which will probably be treated this fall. In Imperial County, 814 miles of roadsides were checked with an estimated 19 percent infested with beet leafhopper. (Cal. Coop. Rept., June 29). UTAH - Populations generally low over most of State. (Knowlton). IDAHO - Total of 12,912 acres in Elmore, Ada, Twin Falls, Jerome and Gooding Counties were sprayed by aircraft and ground equipment. All planned control work completed. (Grass. Cont. Proj.).

SQUASH VINE BORER (Melittia cucurbitae) - DELAWARE - Adults active on squash east of Georgetown. (Milliron).

CABBAGE LOOPER (Trichoplusia ni) - DELAWARE - Troublesome on crucifers generally. Feeding on tomato foliage at many places. (Milliron). SOUTH CAROLINA - Considerable feeding on tomatoes during June in Mt. Pleasant area. (Nettles).

CABBAGE CATERPILLARS - SOUTH CAROLINA - Infestations of cabbage looper, imported cabbageworm and diamondback moth caused 88 percent of untreated plants in late-spring cabbage planting in Charleston County to be ineligible to U. S. Grade No. 1. Cabbage looper quite difficult to control with insecticides now in common use. (Cuthbert et al.). VIRGINIA - Untreated cabbage in eastern area heavily infested with Trichoplusia ni, Pieris rapae, and Plutella maculipennis. (Brubaker, Greenwood, Hofmaster). PENNSYLVANIA - Imported cabbageworm heavy on early-planted cabbage in southeastern area. (Menusan). WISCONSIN - P. maculipennis on cabbage in Chippewa, Eau Claire and Portage Counties. (Wis. Ins. Bul). NORTH DAKOTA - Imported cabbageworm hatching July 4. (N. D. Ins. Rept.).

ONION MAGGOT (Hylemya antiqua) - IDAHO - Abundant in southwestern area. Bulbs 80 percent infested in some fields. Some fields previously treated for maggot control. Infestations increasing rapidly in commercial fields. Heavy populations of adults in all onion fields. (Gittins).

ONION THRIPS (Thrips tabaci) - IDAHO - Generally light populations in onion seed fields in Caldwell area. (Gittins). UTAH - Injury becoming more conspicuous in some localities. (Knowlton).

LEAF MINERS - MICHIGAN - Metallus rubi very numerous in unsprayed dewberry plantings in Millberg, Coloma and Watervliet. (Hutson, June 23).

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) - NEW JERSEY - Feeding damage to strawberries, particularly in southern area. (Ins. - Dis. News.). WASHINGTON - Medium to severe in several raspberry fields in Snohomish County. (Kamal). MICHIGAN - General on strawberries at St. Joseph, Grand Rapids, Traverse City and Manistee. (Hutson, June 24).

STRAWBERRY CROWN MOTH (Ramosia bibionipennis) - OREGON - Adults began to emerge in Hillsboro area, June 25-30. (Rosenstiel).

CYCLAMEN MITE (Steneotarsonemus pallidus) - WASHINGTON - Heavy infestation of strawberry plantings at Prosser. (Frick).

TOBACCO INSECTS

HORNWORMS (Protoparce spp.) - KENTUCKY - Populations of principally P. quinquemaculata generally abundant on tobacco in central area. About 1 larva per 4 to 5 plants. (Boush). NORTH CAROLINA - General, very light infestations on tobacco averaged 3.4 eggs and 7 larvae per 25 plants in Martin County, June 29 and 1.2 eggs and 1.6 larvae per 25 plants in Johnston County June 22. (Brandon, Maxwell). MARYLAND - Infestation on tobacco general in southern area. Control being applied. (U. Md., Ent. Dept.). VIRGINIA - General and medium on tobacco in Greensville County. Seem to be heavier than usual. (Rogers). Light trap catches in Pittsylvania County continued to fall off. (Dominick).

BUDWORMS (Heliothis spp.) - NORTH CAROLINA - Light infestation on tobacco in Granville County (Chamberlin). Averaged 4.6 per 25 plants in Martin County on June 29. (Brandon, Maxwell). Spotted and less than 1 per 25 plants in east central counties. (Farrier). GEORGIA - H. virescens moderate to heavy on tobacco in Laurens, Dodge, Wheeler, Treutlen and Emanuel Counties. (Johnson).

CABBAGE LOOPER (Trichoplusia ni) - GEORGIA - Heavy infestations on tobacco in Tift County. (Morgan). NORTH CAROLINA - Local outbreak in Johnston County. (Maxwell, Farrier).

STINK BUGS - TENNESSEE - Local minor attacks on tobacco in State. (Mullett).

STALK BORER (Papaipema nebris) - MASSACHUSETTS - Numerous reports on tobacco. (Bourne). KENTUCKY - Infesting two fields in Fayette County. Injury most noticeable on field margins near ragweed. (Boush).

SNOWY TREE CRICKET (Oecanthus niveus) - TENNESSEE - Local minor attacks on tobacco. (Mullett).

SEED-CORN MAGGOT (Hylemya cilicrura) - MASSACHUSETTS - Tobacco field in north Amherst plowed up and reset after severe damage. (Bourne).

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - KENTUCKY - Generally present on tobacco in central area. Infestation averages 5-10 per plant. Boush).

GREEN PEACH APHID (Myzus persicae) - GEORGIA - Heavy on tobacco in Laurens and Dodge; moderate in Wheeler, Treutlen and Emanuel Counties. (Johnson).

GRASSHOPPERS - NORTH CAROLINA - Becoming more numerous and causing some slight damage on tobacco in Granville County. (Chamberlin).

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis) - SOUTH CAROLINA - Average percentage infestation in 36 counties: treated fields 8 percent, untreated fields 27 percent. (Cott. Lett.). Three percent square infestation in 8 treated fields in Florence County. Untreated check areas in 6 fields had 24 percent infestation. Thirteen percent infestation in 40 treated fields in Darlington County. (Walker et al.). NORTH CAROLINA - Seems to be increasing in lower Piedmont region. Most counties have moderate infestation in many fields. (Cott. News Lett.). Infestations continue spotty with heaviest populations in south central counties. Light in northeastern counties. (Jones et al.). GEORGIA - Average infestation in 15 counties was 28 percent punctured squares. (Johnson, Hinton). TENNESSEE - Serious damage in southwestern counties in fields with squares old enough. Thirty-five percent infested squares this week compared with 17 last week and 2 percent at same time last year. Controls underway over area. (Locke). ALABAMA - Examinations in 32 fields in 7 northeastern counties showed square infestation of 31.5 percent. (Tyus). MISSISSIPPI - First-generation field weevils emerging in south delta and Stoneville area. Emergence lower than anticipated in most areas, hot dry weather important factor. Of 12 fields examined in south Washington, Sharkey and Issaquena Counties, 10 infested at rate of 9.3 percent. Twenty-seven fields in Stoneville had 7.1 percent compared with 6.3 last week and 4.1 at same time last year. (Merkl et al.). LOUISIANA - Continued high infestations with many fields having large numbers of first-generation weevils. Total of 17 fields examined in 6 parishes with infestation averaging 15-59 percent. (Oliver). Squares examined in 80 fields in Tallulah area and all were infested at rate of 22 percent compared to 26 percent last week. Emergence of first-generation weevils becoming more general. (Gaines Pfrimmer et al.). TEXAS - Some increase in McLennan and Falls Counties but mostly due to scarcity of squares in early fields. Average of 22.8 percent punctured squares in 17 untreated fields and 8 in 22 treated fields. (Parencia et al.). Large numbers in fields not mature in lower Rio Grande Valley. (Deer). Light to heavy in upper coastal, east and northeast areas. (Fuller, Martin). MISSOURI - Only 3 of 280 fields surveyed showed punctures ranging from 1 to 10 percent. Weevils emerging from squares at Sikeston July 3. (Adkisson). ARKANSAS - First-generation weevils emerging over State. Where conditions have been favorable, these weevils increasing rapidly. Average infestation: southeast area 8 percent compared with 6 last week, east central area 4.1 compared with 2.8, northeast 5.8 compared with 2.9, central 30.2 compared with 20.8, southwest 39.6 percent. (Warren, Harrendorf, Barnes).

BOLLWORMS (Heliothis spp. et al) - SOUTH CAROLINA - In many instances bollworm problem greater threat than boll weevil. Most high infestations in Coastal Plain counties. As high as 25 percent square infestation in some fields in Allendale County. (Cott. Lett.). Decrease of eggs in Florence County, .4 per 100 terminals in 6 fields. Average of 2.4 percent damaged squares in 12 fields in this county. (Walker et al.). NORTH CAROLINA - Very light and scattered in cotton in east central counties. (Farrier). GEORGIA - Average of 2 eggs and 2 larvae per 100 terminals in 12 counties. (Johnson, Hinton). TENNESSEE - Only small numbers in west Tennessee. (Locke). ALABAMA - Average infestation in 7 northeastern counties was 1.9 percent. (Tyus). MISSISSIPPI - Not a problem at present in delta counties. (Merkl et al.). LOUISIANA - Remain very light. (Oliver). Average of 2.7 eggs and 2.2 larvae per 100 terminals in infested fields in Tallulah area. (Gaines, Pfrimmer et al.). TEXAS - Injurious infestations in irrigated fields in McLennan and Falls Counties. Average of 5.5 eggs and .6 larva per 100 terminals in 34 fields. (Parencia et al.). Increased in south central, central and east areas. (Fuller, Martin). ARIZONA - Heliothis zea adults increasing and more widespread, June 29. Oviposition on cotton increasing. Severe infestation, 10 per 100 sweeps, in some fields in Pima County. (Ariz. Coop. Rept.). ARKANSAS - Activity increasing in many fields. (Warren, Harrendorf, Barnes). OKLAHOMA - Light in Caddo and McCurtain Counties. (Flora).

PINK BOLLWORM (Pectinophora gossypiella) - TEXAS - Bloom inspection in 42 central counties shows increase over 1955 in most counties. Averages for the 42 counties were 157 pink bollworms per 100,000 blooms in 1956 compared with 73 in 1955. Thirty-six percent of fields infested against 26 for 1955. (PBW Cont. Proj.).

PLANT BUGS - MISSOURI - Continue to slowly increase in cotton counties. From 1-28 per 100 terminals in 90 percent of fields surveyed. (Adkisson). TENNESSEE - Very light damage in west Tennessee. (Locke). MISSISSIPPI - Fleahoppers and tarnished plant bugs reported from many fields in delta counties not treated recently but little damage. (Merkl et al.). ARIZONA - Lygus increasing in cotton in Maricopa County, June 29, up to 15 per 100 sweeps. Two per 100 sweeps in Santa Cruz Valley. (Ariz. Coop. Rept.).

FLEAHOPPERS - ARIZONA - A black fleahopper (prob. Spanagonicus albofasciatus) taken at 12 per 100 sweeps in Santa Cruz Valley. (Ariz. Coop. Rept.). TEXAS - Light over most of State with a few injurious infestations in central and south plains areas. (Fuller, Martin). Decrease in cotton fleahopper in McLennan and Falls Counties. (Parencia et al.). Still heavy in McCook area. (Deer). OKLAHOMA - From 0-39 per 100 terminals in Caddo County and 0-21 per 100 in Tillman and Washita Counties. (Flora). TENNESSEE - Widespread in west Tennessee, light damage. (Locke).

THRIPS - ARIZONA - High populations remain in late-planted cotton, June 29. Considerable loss of young fruiting structures and malformation of plants. (Ariz. Coop. Rept.).

APHIDS - GEORGIA - Aphis gossypii light on cotton in 5 counties. (Johnson). ARIZONA - Generally light but a few heavy infestations in Maricopa to Santa Cruz Counties, June 29. (Ariz. Coop. Rept.).

SPIDER MITES - NORTH CAROLINA - Reported in many counties, some fields have general infestation. (Cott. News Lett.). SOUTH CAROLINA - Continue to increase in a few counties. (Cott. Lett.). GEORGIA - Moderate on cotton in Pike (June 29) and Elbert Counties. (Beckham, Johnson). ARKANSAS - Appearing in local areas, heavy some spots. (Warren, Harrendorf, Barnes). ARIZONA - Generally light but a few heavy infestations in Maricopa to Santa Cruz Counties, June 29. (Ariz. Coop. Rept.).

WHITEFLIES - ARIZONA - Increasing on late-planted cotton June 29, some stunting. (Ariz. Coop. Rept.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

LARCH SAWFLY (Pristiphora erichsonii) - MICHIGAN - Hatching in Keweenaw County, June 29. (Hutson).

PINE SPITTLEBUG (Aphrophora parallela) - WISCONSIN - Heavy on 12-15 year old reproduction in Polk County. Some adults appearing. (Wis. Ins. Bul.).

FOREST TENT CATERPILLAR (Malacosoma disstria) - MINNESOTA - Heavy defoliation in areas of St. Louis and Carlton Counties. Pupation underway. (Minn. Ins. Rept.).

JACK-PINE BUDWORM (Choristoneura pinus) - WISCONSIN - Pupation in Douglas and Polk Counties. Approximately 21,000 acres treated in northwestern area. (Wis. Ins. Bul.). MINNESOTA - Moderate to heavy defoliation in most jack pine stands around Brainerd, Park Rapids and Bemidji. (Minn. Ins. Rept.).

SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus) CALIFORNIA - Reported for first time in Marin County, June 19. (Cal. Coop. Rept.).

COTTONWOOD BORER (Plectrodera scalator) - OKLAHOMA - Reached peak of emergence in Payne County week of June 24-30. Ovipositing eggs of poplar. (Beiberdorf).

OAK LACE BUG (Corythucha arcuata) - DELAWARE - Very prevalent on white oak in Redden State Forest. (Milliron).

ELM LEAF BEETLE (Galerucella xanthomelaena) - ALABAMA - Serious damage to elm trees in Lee County. (Blake). IDAHO - Considerable skeletonizing of leaves on many unsprayed elm trees in Canyon and Owyhee Counties. (Gittins). VIRGINIA - Larvae heavy and causing some defoliation of elm trees in several areas. Pupation some areas. (Morris).

RED-HEADED PINE SAWFLY (Neodiprion lecontei) - MICHIGAN - Hatching in Otsego County, July 2. (Hutson).

BAGWORM (Thyridopteryx ephemeraeformis) - ILLINOIS - Heavy in places of Carbondale area. (Chandler). MISSOURI - Continues to heavily damage evergreens and other ornamentals around homes and have largely defoliated areas of cedar over southern two-thirds of State. Other trees damage include black locust, willows, sycamore and box elder. (Kyd, Thomas).

A TUSSOCK MOTH - PENNSYLVANIA - Outbreak on oak, maple and apple in southeast area. (Menusan).

MIMOSA WEBWORM (Homadaula albizziae) - MARYLAND - Conspicuous on mimosa trees in most sections. (U. Md., Ent. Dept.). PENNSYLVANIA - Beginning to appear on honey locust in south central area. (Pepper).

LOCUST LEAF MINER (Chalepus dorsalis) - VIRGINIA - Larvae very heavy on locust trees in some areas of Charlotte County. (Morris). MARYLAND - Moderate to heavy on black locust. (U. Md., Ent. Dept.).

WALNUT CATERPILLAR (Datana integerrima) - TEXAS - Heavy widespread on pecan, oak and other trees in Brazoria County. (Vaughan).

FALL WEBWORM (Hyphantria cunea) - MISSISSIPPI - Webs numerous and generally distributed. (Hunsucker).

GREEN-STRIPED MAPLEWORM (Anisota rubicunda) - MISSOURI - Soft maples in central and northern thirds of State from 10-75 percent defoliated. (Kyd, Thomas). KANSAS - Many trees in northeast partially defoliated. (Gates).

LACE BUGS - VIRGINIA - Light to heavy on sycamore and oak trees in Franklin County. (Morris).

MITES - MASSACHUSETTS - Spruce mites increasing rapidly on spruce, red cedar, arborvitae and hemlock. (Crop Pest Cont. Mess.).

RHODE ISLAND - Oligonychus ununquis beginning to appear heavily in nurseries. (Mathewson). KANSAS - Light to heavy on shade trees and ornamentals in many areas. (Matthew).

RHODODENDRON LACE BUG (Stephanitis rhododendri) - RHODE ISLAND - Nymphs appearing heavily on rhododendron for first time this season. (Mathewson).

JAPANESE BEETLE (Popillia japonica) - MASSACHUSETTS - First emergence June 27-28. Large numbers now. (Bourne). MARYLAND Abundant on ornamentals in Montgomery and Prince Georges Counties. (U. Md., Ent. Dept.). PENNSYLVANIA - Adults becoming fairly abundant in south central area. (Pepper). WEST VIRGINIA - Heavy feeding on ornamentals in local areas of Monongalia County. (Dorsey, Hansen). NORTH CAROLINA - Occurring in Warren County. (Jones). OHIO - Emergence about ten days late. Appearing in numbers in southern area but seen only rarely in northern area. (Polivka, June 29).

AZALEA LEAF MINER (Gracilaria azaleella) - OHIO - Larvae abundant in leaves of azalea in Lake County during June. (R. B. Neiswander).

ROSE CHAFER (Macrodactylus subspinosus) - WISCONSIN - Still very abundant on light soils. (Wis. Ins. Bul.).

INSECTS AFFECTING MAN AND ANIMALS

MOSQUITOES - UTAH - Continue serious problem in many areas. (Fronk). MINNESOTA - General nuisance throughout State. (Minn. Ins. Rept.).

HORN FLY (*Siphona irritans*) - OKLAHOMA - Averaged 2,000 per cow in Noble County; 600 per cow in Major County. (Coppock). KANSAS - From 40-180 per animal on range cattle in Comanche and Barber Counties; not increasing. (Matthew).

FLIES - ARIZONA - Flies, mainly *Musca domestica* (population indices of 2 small towns in southeast Maricopa and northwest Pinal Counties): average of 5 highest grill counts in 9 blocks June 17-23 was 53, June 24-30 was 49.6. (Ariz. Coop. Rept.). MARYLAND - *Fannia canicularis* abundant around poultry pens in Queen Annes County. (U. Md., Ent. Dept.).

TABANIDS - RHODE ISLAND - *Tabanus lasiophthalmus* abundant on cattle at East Greenwich. (Steve).

SHEEP SCAB MITE (*Psoroptes equi ovis*) - VIRGINIA - Found on 147 head of 319 inspected in June; 264 were dipped to control the scabies; 93 were on two farms in Frederick County. (Va. Livestock Health Bull.).

CHIGGERS - WEST VIRGINIA - Much annoyance to man in Berkeley, Morgan and Jefferson Counties. (Dorsey, Hansen).

FLEAS - TENNESSEE - Large number in and around homes in State. (Mullett).

BENEFICIAL INSECTS

ARIZONA - Beneficial insects remained high in cotton fields June 29, Maricopa County to Santa Cruz County. *Hippodamia convergens*, *Collops* sp., *Geocoris* sp., and *Chrysopa* sp. very abundant in Santa Cruz Valley south of Tuscon July 5. (Ariz. Coop. Rept.).

AN ICHNEUMONID PARASITE (*Campoletis perdistinctus*) - NORTH CAROLINA - Twenty to fifty percent of budworms on tobacco parasitized in east central counties. (Farrier, Bigornia).

MISCELLANEOUS INSECTS

EUROPEAN EARWIG (*Forficula auricularia*) - UTAH - Abundant and annoying in many areas. (Knowlton).

STORED PRODUCTS INSECTS

KHAPRA BEETLE (Trogoderma granarium) - WISCONSIN - Inspection of 139 commercial establishments showed no khapra beetle to be present. However, black carpet beetle was found in nearly all locations with heavy populations in many. (Wis. Ins. Bul.).

CORRECTIONS

CEIR 6(26):619 - Under TOBACCO HORNWORMS (Protoparce spp.) - NORTH CAROLINA - Averaged 1 larva and 1 egg per 25 plants in east central counties (Farrier).

ADDITIONAL NOTES

KANSAS - SPOTTED ALFALFA APHID appears to be building up in southern and central areas. Localized infestations with populations requiring controls in some areas of Barton, Pawnee, Ford, and Finney Counties. No aphids found in several northeast counties. (Gates, Matthew). GRASSHOPPER control continued in Comanche County. Severe populations continue on rangeland of Comanche, Clark, Barber, and Kiowa Counties where control measures have not been applied. During week, there was light migration back into some of previously sprayed areas and populations increased to about 3 to 5 per square yard. Dominant range species in this area, Philbostroma quadrimaculata and Aulocara elliotti, laying eggs. Elsewhere in Kansas, adults moving into row crops, corn fields, soybeans, and into home gardens. (Matthew).

NEW YORK - ORIENTAL FRUIT MOTH heaviest in years in western area as indicated by infested terminals. APPLE MAGGOT flies began increasing at Geneva July 6. APHIDS numerous in orchards in Westchester, Columbia Counties and increasing in Orleans County. RED-BANDED LEAF ROLLER greatest potential threat to apple crop in Niagara County. PLANT BUGS damaging strawberry in Oswego County. CORN EARWORM about same as last year in Hudson Valley. Mature FALL ARMYWORM collected in Nassau County on corn. EUROPEAN CORN BORER very prevalent in Rockland County, much heavier than normal in Westchester County, very heavy in tassels in Dutchess County. (N. Y. Wkly. Rept.).

CONNECTICUT - EUROPEAN CORN BORER infestations in scattered potato fields in Hartford County. Moderate in untreated corn. POTATO LEAFHOPPER being found in alfalfa. Infestations of ARMYWORM localized in Hartford, New London, Tolland, and Windham Counties. Infestations of APPLE APHID generally severe on apples over State. First APPLE MAGGOT adults taken in traps at Storrs. EUROPEAN RED MITE numerous in few orchards in Hartford and Tolland Counties, and TWO-SPOTTED SPIDER MITE building up on apples in some orchards in Hartford and Windham Counties. APHIDS numerous on peppers, egg plant and tomatoes. CABBAGEWORMS are generally low. LEAFHOPPERS very numerous on lettuce, beans and carrots. CORN FLEA BEETLE populations are lower than usual. STRIPED CUCUMBER BEETLE population rapidly declining. MEXICAN BEAN BEETLE lower than normal. (Tunis, Minnum).

WYOMING - COLORADO POTATO BEETLE larvae damaging potatoes in vicinity of Powell. Completed control measures on 189, 220 acres for GRASSHOPPERS and MORMON CRICKET and considerably more acreage still requires spraying. (Spackman).

WEATHER OF THE WEEK ENDING JULY 9, 1956

The predominate weather situation existing during the past week was one of low pressure and frontal activity, which extended in general from the southwestern Great Plains to south of the Great Lakes region then eastward to the Atlantic Coast, dividing areas of cooler air in the West and North from the warmer air in the South Central and Southeast. Heaviest precipitation occurred in showers along the frontal boundary. In addition weekly totals were moderate to heavy along the Gulf of Mexico eastward from Louisiana, in the northern Great Plains and Montana, and western Washington. Some excessive falls during the week were 5.03 inches in one shower at Hot Springs, Arkansas on July 8, and 1.23 inches at Unionville, Maryland, in an estimated period of one minute on July 4. In contrast, no precipitation of consequence was reported in the states of Oregon, California, Idaho, Montana, Utah, New Mexico, and Arizona. Texas fell in this group with the exception of a few isolated showers, one of which resulted in a weekly total of over 4 inches.

Weekly temperature avg. were near normal to slightly above south of the frontal border while to the west averages were below by as much as 6° from San Joaquin Valley, Calif., northward, and to the north along the Canadian Border by 9° in northeastern Montana and northern Maine. Temperatures were above 100° at one or more locations in Arizona and Texas on all days, while on July 6, Bridgeport and Hartford, Conn., reported maxima of only 60°, record lows of this value for the month at both locations.

Hail storms were reported in isolated areas in many states. Some damages were reported to uncut grain in Colorado, serious crop damage in Horry County, S. C., and some grape damage in Arkansas. On July 5, Payneville, Minn., reported damage to an area of 60 square miles with estimates of 80 percent to total loss for some fields. (Sum. Suppl. by U. S. Weather Bureau).

UNIFORM SURVEY PROCEDURE FOR DETERMINING SAMPLE SIZE
THE LAKE STATES FOREST INSECT SURVEY COMMITTEE - 1956

INTENSITY OF SAMPLING

PURPOSE:

The purpose of this brief section is to illustrate the evaluation of sample size. This problem confronts every investigator who plans to employ sampling for his enumeration job. The discussion considers chiefly simple random sampling, stressing the importance of proper evaluation of such items as the degree of expected variability in the statistic involved and the sampling accuracy desired.

DETERMINING THE NUMBER OF SAMPLE PLOTS:

The following formula should be used in determining the number of random sample plots required in estimating timber to the accuracy determined. The formula is based on original work by S. R. Gevoriantz and W. A. Duerr of the Lake States Forest Experiment Station. [1/]

Formula: $$N = \frac{A(C)^2}{A(E)^2 + a(C)^2}$$

E = percent of accuracy expressed as decimal
A = total area to be sampled in acres
N = number of sample plots
a = area of the sample plot in acres
C^2 = coefficient of variation squared

Example: Given
A = 1,000 acres
E = .10 (10 percent)
C^2 = 1.0
a = .2 acres

Then: $$N \quad \frac{1,000 \times 1.0}{1,000 \times .10^2 + .2 \times 1.0} = 98 \text{ plots}$$

In setting up a sampling scheme, one frequently needs an a priori knowledge of the variability involved. One good measure of variability is the coefficient of variation. It can be estimated by knowing certain characteristics of the expected scatter of the individual samples. From previous experience it is possible, for example, to anticipate the range (R) of the total variability, or the difference between the maximum and the minimum values, their expected average, or the mean (M), and the percent of values (P) that would fall in the middle third of this range.

The approximate value of the coefficient of variation (C) can then be calculated from the expression worked out by S. R. Gevorkiantz which relates all three factors regardless of the type of distribution involved.

[1/] Forest Survey Section, Timber Management Handbook R-9, Forest Service 65-Appendix, Amended March, 1953. Examples on pages 676, 677, 678 are from this Section.

$$C = \frac{R}{(1 + \frac{P}{14})\ M}$$

Example 1:

M = 8 cords per acre

R = 16 cords per acre

P = 56 percent

$$C = \frac{16}{(1 + 4)\ 8} = \frac{16}{40} = .40$$

Example 2:

M = 7 cords per acre

R = 16 cords per acre

P = 28 percent

$$C = \frac{16}{(1 + 2)\ 7} = \frac{16}{21} = .76$$

For a more accurate evaluation of C, a reconnaissance survey is required. In this reconnaisance, a few plots, well scattered over the area, can be taken as a sample to indicate the total variability involved. Later on, more plots can be obtained to complete the survey.

The coefficient of variation is the standard deviation expressed as a percent of the mean. Information on computation of the standard deviation and coefficient of variation can be found in more recent mensuration texts. Bruce and Schumacher "Forest Mensuration" and Girard and Gevorkiantz "Timber Cruising" have good descriptions of the procedure.

Example of computation of standard deviation and coefficient of variation for a small number of plots:

Plot #	Vol/A	Deviation (d) (Plot vol. - M)	Deviation squared (d^2)
1	4	-2.9	8.41
2	6	- .9	.81
3	8	+1.1	1.21
4	5	-1.9	3.61
5	6	- .9	.81
6	12	+5.1	26.01
7	3	-3.9	15.21
8	0	-6.9	47.61
9	8	+1.1	1.21
10	7	+ .1	.01
11	4	-2.9	8.41
12	11	+4.1	16.81
13	8	+1.1	1.21
14	14	+7.1	50.41
15	6	- .9	.81
16	10	+3.1	9.61
17	8	+1.1	1.21
18	4	-2.9	8.41
19	6	- .9	.81
20	8	+1.1	1.21
	138	-25.0	203.80
		+25.0	
Total disregarding sign		50.0	

Average or Mean (M) = $\frac{138}{20}$ = 6.9

Std. Deviation (S) = $\sqrt{\frac{\Sigma\ d^2}{n - 1}}$ = $\sqrt{\frac{203.80}{19}}$ = $\sqrt{10.72}$ = 3.27

Σ = Total or Sum of

n = Number of plots

Coefficient of Variation (C) = $\frac{S}{M}$ =

$\frac{3.27}{6.9}$ = .47 (expressed as a decimal)

For a large number of plots the computations by this method are laborious and can be shortened by setting up a frequency table. This method is particularly convenient for calculating the coefficient of variation after all data are collected. An example of this procedure, based on an assumed cruise in a pulpwood stand where 213 plots were taken, is given below:

Class limits	Midpoint class	No. of plots	Deviation from Assumed Mean (A)	d^2	nd	nd^2
	x	n	d			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0- .99	.5	1	-8	64	- 8	64
1.0- 1.99	1.5	4	-7	49	- 28	196
2.0- 2.99	2.5	7	-6	36	- 42	252
3.0- 3.99	3.5	13	-5	25	- 65	325
4.0- 4.99	4.5	12	-4	16	- 48	192
5.0- 5.99	5.5	17	-3	9	- 51	153
6.0- 6.99	6.5	24	-2	4	- 48	96
7.0- 7.99	7.5	29	-1	1	- 29	29
8.0- 8.99	8.5	28	0	0	0	0
9.0- 9.99	9.5	21	+1	1	+ 21	21
10.0-10.99	10.5	18	+2	4	+ 36	72
11.0-11.99	11.5	15	+3	9	+ 45	135
12.0-12.99	12.5	12	+4	16	+ 48	192
13.0-13.99	13.5	6	+5	25	+ 30	150
14.0-14.99	14.5	4	+6	36	+ 24	144
15.0-15.99	15.5	2	+7	49	+ 14	98
Total		213			-319 +218 -101	2,119

$$x = \frac{\Sigma\ (nd)}{\Sigma\ n} = \frac{-101}{213} = -.474$$

$$M = A + x$$

$$M = 8.5 + \frac{(-101)}{213} =$$

$$8.5 - .47 = 8.03 \text{ cords}$$

Average volume per A.

$$C = \frac{S}{M} = \frac{3.13}{8.03} = .39$$

$$C^2 = (.39)^2 = .1521$$

$$S = \sqrt{\frac{\Sigma\ (nd^2)}{\Sigma\ n-1} - x^2}$$

$$S = \sqrt{\frac{2119}{212} - (-.474)^2}$$

$$S = \sqrt{9.995 - (.225)} = \sqrt{9.77}$$

$$S = 3.13 \text{ cords}$$

M = Mean or Average
A = Assumed Average
x = Correction to Assumed Average
n = Number of Plots
d = Deviation from Assumed Average
S = Std. Deviation
C = Coefficient of Variation

The procedure used is as follows:

1. When individual plot data have been collected, set data up in a frequency distribution table in columns 1, 2, and 3. That is, combine data into classes showing class limits in column 1, midpoint of class in column 2, and number of plots (n) in that class in column 3. Tabulate classes in order of size.

   There is no definite rule as to the number of classes to use, but it should be between 5 and 30. As a guide, use 6 - 10 classes for less than 100 plots, 10 - 15 for 100 to 1,000 plots, and 15 - 25 for over 1,000 plots.

2. Assume an average or mean (A) - which should be near the center of the frequency distribution. In a normal distribution the class having the highest number of plots will be near the average.

3. Subtract the midpoint of each class from the assumed mean and enter in column 4. This is the deviation (d) from the assumed mean (A).

4. Square this deviation (d) and enter in column 5.

5. Multiply the number of plots (n) in each class from column 3 by the deviation (d) from column 4 and enter in column 6.

6. Multiply the deviation squared (d^2) from column 5 by the number of plots in each class (n) from column 3 and enter in column 7.

7. Total columns 3, 6, and 7.

8. Then the correction (x) for the assumed mean equals the total of column 6 divided by the total of column 3 or $\frac{\Sigma\ nd}{\Sigma\ n}$ where the symbol Σ means "total."

9. The Mean (M) or average equals the assumed Mean (A) plus the correction (x) from step 8. M = A + x.

10. The standard deviation (S) equals:

$$S = \sqrt{\frac{\Sigma \quad nd^2}{\Sigma \quad n-1} \qquad -x^2}$$

In estimating the intensity of sampling needed, special attention should also be given to the degree of accuracy (E) assumed for the job. Although it is well recognized that E should vary with the importance of the statistic involved, many mistakes are made in overlooking the fact that E should vary with the area covered by sampling. It is improper, for example, to assign the accuracy of 10 percent ($E = .10$) for the survey involving 40 acres as well as for the one involving 40,000 acres, unless an effort is made to expand the value of the coefficient of variation (C) to allow for the natural increase in variability as the area gets larger. Although there is no special rule which would set the value of E for all jobs, it is believed that the minimum number of plots should be in the neighborhood of

$$N = 20\sqrt{A_0 C}$$

based on the assumption that percent sample (p) should be smaller than

$$p = \frac{20\ a\sqrt{C}}{A_0}$$

where A_0 = area of the tract in units of 100 acres

C = coefficient of variation (decimals)

a = area of sample plot in acres

Thus, with $C = 1.0$, one would need on the area comprising 400 acres about

$$N = 20\sqrt{4 \times 1} = 40 \text{ plots.}$$

If it is anticipated that separate statistics will be needed by different subdivisions of the total area, the required number of plots should be computed for each subdivision under consideration. Simple random sampling has been assumed throughout. More efficiency can be attained by stratification of the area. Any stratification will reduce the error of sampling even with a considerably smaller total number of plots. Instead of taking random samples over the entire area, the area can be separated first into units or condition classes which differ widely from each other but are essentially uniform within. The next step then would be to take plots from each unit or stratum. Let us assume that in the example above the area was divided into three homogeneous parts, each having more or less uniform conditions, and only one-half as many plots were employed. If the stratification is really good, it means that the coefficient of variation within each stratum should be considerably below 1.0 which is the relative variability of all observed values from the grand average comprising widely different conditions.

Assuming the within variation to range only from 0.2 to 0.4 we get:

Subdivision	Proportion of area (p)	Coefficient of variation (c)	Number of plots (n)	Error of variance c^2/n	Product c^2p^2/n
1	.4	.4	10	.016	.00256
2	.2	.3	5	.018	.00072
3	.4	.2	5	.008	.00128
	1.0		20		.00456

Here the sampling error is:

$$\sqrt{.00456} = .0675 \text{ or } 6.75 \text{ percent}$$

as compared to

$$\frac{1.0}{\sqrt{40}} = .158 \text{ or } 15.8 \text{ percent obtained by simple random}$$

sampling employing twice as many plots. The example above, of course, assumes very sharp stratification characterized by very uniform conditions within each stratum. This would be difficult to obtain in actual practice. The main principle of the reduction of error, however, will hold in all cases employing proper stratification. Whenever possibilities for real stratification exist, they should be considered in every sampling plan.

LIGHT TRAP COLLECTIONS	Pseud.	Agrotis	Prod.	Perid.	Feltia	Heliothis		Protoparce		Laphyg.
	unipun.	ypsilon	ornith.	marg.	subt.	zea	viresc.	sexta	quinq.	frugip.
SOUTH DAKOTA										
Brookings 7/3, 7/5	105				5					
NEBRASKA (Counties)										
Lancaster 6/17-23		21		2		12			4	
Lincoln 6/8-17		353		1681		1			20	
Scotts Bluff 6/19-23		30		89		4			3	
MINNESOTA (County)										
Ramsey 7/2, 4-5	49	5								
MISSOURI (County)										
Boone 6/30-7/6	53	23		28		26		11		
WISCONSIN										
DeForest 6/27-7/1	24					32				
ILLINOIS										
Urbana 6/29-7/5	249	15	24	108		3		11		
INDIANA (Counties)										
Lawrence 6/21-7/6	226	20	16	197		1		59	19	
Tippecanoe 6/22-7/6	336	15	22	48		1		1	3	
OHIO (County)										
Athens 6/18-7/1	33	17								
VIRGINIA (County)										
*Pittsylvania 6/24-30								69	104	
NORTH CAROLINA (Counties)										
Duplin 7/4-5			14		8	2	1	2	5	
Johnston 7/4-5	1	3	19		13	14	1	3	4	
SOUTH CAROLINA (Counties)										
Charleston 6/18-24			8		7	2		2		
Florence 6/23-29	1	14	120	13	361	908	165	75		
Oconee 6/24-30	8	4	17	8	42	13		1		
GEORGIA (Counties)										
Clarke 6/23-7/3		6						19		
Spalding 7/2-5	2	2	12	10	76	27	2	3	1	
Tift 6/29-7/5	14	110	47		133	58		37	1	
FLORIDA										
Quincy 6/26, 7/2	3		1		21	23	5	9		
Monticello 6/28			1		3			3		
Gainesville 6/27					2	2	1			
TENNESSEE (Counties)										
Madison 6/26-7/2	8	4	4	12		8				
Lawrence	40		4	16		8		12		
Maury	12		56	8		8	8			
Robertson	152	16	24	60		16		19	1	
Cumberland	8	2	6	14		4		23	4	
Knox	12		24	8		24		4		
Greene	112	32	48	168				33	9	
Blount	28		24	28				5		
Johnson	128	92	21	82		2	2	1	3	
MISSISSIPPI (Counties)										
Coahoma 6/30-7/6	1	7	109	2		52				
Humphreys			108		3	56				
Lauderdale			7	4	2	3				
Marshall			17							
Oktibbeha	60	14	286	6	32	44	8			
LOUISIANA										
*Tallulah	48	14	167	2	197	480	16	171	4	20
Baton Rouge 6/30-7/6	6	7	57	1	63	12		31		38
Curtis 6/21-7/1		3			11	19		11	3	
Franklin 6/28-7/4	8	3	77		8	18				25
ARKANSAS										
Hope 6/29-7/5						83				
Van Buren 6/28-7/5	1					22				
Varner 6/28-7/4		26				24				
Fayetteville 6/30-7/6	24	15		9		86				
Clarksville 6/9-7/2	42	48		16		54				
TEXAS										
College Station 7/1-2			8	1		897				18
Denton 6/16-30	1		6			119				2
Waco 6/30-7/6	1	3		13	13	615				
Winter Haven 6/16-29	1	2				41				2

Other Collections: Georgia (Tift Co., 6/29-7/5): Elasmopalpus lignosellus 16. Nebraska (Lancaster Co., 6/17-23): Empoasca fabae 438.

*Three traps Pittsylvania County, Virginia; Tallulah, Louisiana.